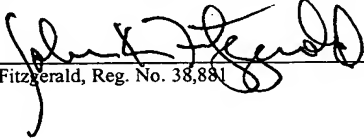




CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence (with all attachments) is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: MAIL STOP RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 4, 2006.

  
John K. Fitzgerald, Reg. No. 38,881

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	: 10/788,784	Confirmation No.	: 6133
Applicant	: Anthony Richard Gaukroger		
Filed	: 02/27/2004		
Title	: MASTERBATCH		
Art Unit	: 1713		
Examiner	: Peter D. Mulcahy		
Docket No.:	: URQUH-67793		
Customer No.	: 24201		

MAIL STOP RCE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

I, ANTHONY RICHARD GAUKROGER together with STEPHEN ANTHONY MORRIS am the applicant for U.S. Serial No. 10/788,784. We hereby file a request for continued examination of the application on the basis that we do not believe that Romanian Patent Application No. RO-102047 is relevant to the novelty or inventiveness of the invention covered by our application.

We are aware of this Romanian patent application and indeed it was cited during prosecution of a corresponding UK patent application which has now been granted as GB2379221.

To clarify our masterbatch contains compounds typically used in PVC formulations but no PVC resin or compound. The Romanian document refers to use of a PVC resin and that is why stabilizers are included. The masterbatch of the present invention is very different from the PVC concentrate of the prior art and persons skilled in the art of masterbatch technology would differentiate the two types of material discussed.

PVC concentrate of the prior art and persons skilled in the art of masterbatch technology would differentiate the two types of material discussed.

The present invention is concerned with the masterbatch or additives for use in coloring PVC. The masterbatch of the present invention does not contain PVC resin (see examples 1 to 10) and as stated in the application as filed and in particular in paragraphs 7 and 13 of the use of PVC resin in a masterbatch is shown to be undesirable as the inclusion of PVC resin reduces the processing qualities of the masterbatch, thereby making it very difficult to subject the masterbatch to the amount of shearing required to completely include as much of the components required to meet the criteria of a masterbatch and disperse all of these components.

**A person skilled in the art of masterbatch processing would conclude that RO-102047 must discuss compositions containing PVC for the following reasons.**

RO-102047 discloses a composition containing chlorinated polyethylene (0-75%), a processing ad and other ingredients. However, the composition disclosed in RO-102047 must be based upon a PVC resin. A person skilled in the art would realize this because all compositions discussed in the citation contains Ba-Cd stabilizers (which are required and are exclusively to stabilize the PVC resin) and that if no PVC is present no stabilizers would be needed. As mentioned in paragraph 7 and also paragraph 13 of the current application, PVC has a poor thermal stability and doesn't have the ability to be subjected to the desired amount of shear required to blend a masterbatch. The present invention omits the use of disadvantageous PVC and uses other components in the compound as the carrier system. We believe it was never intended that the Romanian document RO-102047 could cover a composition where there is no PVC and we submit that a person skilled in the art on reading this document would not believe that there is no PVC present because of the use of the stabilizers such a cadmium zinc stabilizers. The reference to "0" PVC is an arbitrary and inaccurate figure that has been included in the document because a person skilled in the art would realize that stabilizers would not be present if there was no PVC. It is to be noted that in all of the examples shown in the table of RO-102047 two parts of a barium/cadmium stabilizer is used.

The omission of the PVC in the current invention has the advantage of increased loading of the masterbatch so that it includes all ingredients so that it itself can be added to a final PVC containing formulation to produce a final product. It is the formation of this "pre-final"

compound that is then added to a PVC resin or compound that the current invention is concerned with, not the final PVC concentrate as discussed in the prior art. It would be clear to the person skilled in the art that the composition discussed by the Romanian document could not be composition that is devoid of PVC because it discusses the use of PVC manufacturing technology, which uses lower levels of shear mixing, which is totally opposite from what is carried out in the present invention. The removal of PVC, as has been done for the current invention, allows for the use of high shear rates which allow for the incorporation and dispersion of high levels of additives or color. It is the use of low shear mixing in the Romanian document, which again would lead the person skilled in the art to conclude that there is an error referring to zero levels of PVC because low shear mixing would be used with PVC containing compounds. For a non PVC containing compound there is not the worry about using high shear rates that there is with PVC containing compounds and so the differences in shear rates would lead the person skilled to conclude that despite the reference to zero levels of PVC, the disclosure is incorrect. This is further exemplified by the fact that RO-102047 discusses the use of a high speed dry blend prior to compounding (granulation) which is an essential step in processing a compound containing a PVC, so that the PVC resin can absorb stabilizers etc. before compounding. Again, thus the use of this process in the manufacture of the compositions described would lead the person skilled in the field of polymer processing and masterbatch technology to believe that the Romanian document must use PVC, which is totally opposite from the current application.

Also, the Romanian document does not specifically disclose a composition including a chlorinated polyolefin together with an acrylic processing aid AND an acrylic impact modifier. It does not state that the compounds discussed include this precise combination of materials, i.e. the three aforementioned compound types which allows for a masterbatch to be worked or blended to achieve complete dispersion of all components. The significance of having an acrylic processing aid and an acrylic impact modifier can be exemplified as follows. An acrylic processing aid is significantly different to an acrylic impact modifier. Such differences include the molecular weights of the functional groups, side chains etc. even though they may be based on the same monomers. These in turn are very different from an acrylic flow modifier. The use of the precise materials as claimed in conjunction with the chlorinated polyolefin acts as a binder or carrier of the masterbatch. A person skilled in the art of masterbatch manufacture and PVC

processing would be aware that these are separate and distinct materials which are included in the claims of the current invention as distinct entities. These are no specifically shown in the prior art.

The current invention, by having the claimed ingredients minus PVC, allows for the production of a material where the constituents can be selected and are defined. This allows for the masterbatch which can be added for example to a PVC, where the constituents are predetermined so it is known what is added to the PVC and there is the minimization of including undesirable ingredients into the final product. This could lead to processing difficulties or lead to failures such as plasticizer migration or changes in physical properties of the final product. This would occur in the formulation of the cited document but the realization that PVC can be omitted from a masterbatch which has a formulation as claimed is an unexpected technical improvement that we as inventors have found.

The fact that the current invention is an unexpected improvement is illustrated by the attached press article where our invention is due to change the PVC market in Poland.

Therefore in conclusion, we do not believe that the Romanian document cited by the Examiner, RO-102047, shows the precise combination of materials as claimed by the current invention where there is an acrylic based processing aid as well as an acrylic based impact modifier which is used in a masterbatch which is substantially free of PVC. A person skilled in the art would read the Romanian document and conclude that there must be PVC present due to the processes discussed and the use of stabilizers which are used with PVC containing compositions.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 7<sup>th</sup> Sept., 2006

By: 

Anthony Richard Gaukroger

138988.1

PR 27 - April 2005

**POLYMER-SPECIFIC MASTERBATCH FOR RIGID PVC WILL CHANGE THE COLOURED PVC COMPOUND MARKET IN POLAND**

An innovative material believed to be the world's first polymer-specific colour masterbatch for rigid PVC is poised to change the PVC compound market in Poland.

Developed by Colour Tone Masterbatch in the UK, the PVCu masterbatch is based on patented PVC colouring technology that makes it as easy to colour PVC as any other plastic material. With these properties the masterbatch has the potential to turn the PVC processing market on its head by allowing processors to cash-in on the benefits of lower polymer costs, reduced stock holding and production flexibility.

Universal and polymer specific masterbatches for flexible PVC have been available for many years but they have never worked reliably in rigid PVC because of its inherent processing difficulties. PVC is an extremely versatile polymer but it is very heat sensitive and highly resistant to flow in its melt phase.

**Masterbatch properties**

Processors of the material have always had to find just the right grade for their particular plant and application. Consequently there are literally thousands of PVC formulations on the market with varying amounts of additives and different levels of compounding; all developed to meet specific performance and processing requirements, or both!

Generally masterbatches are made by subjecting relatively high loadings of pigments and polymer to high shear forces such as in a twin screw masterbatch extruder. When this polymer is PVCu it can easily overheat causing the polymer to thermally degrade and producing choking fumes of HCl (hydrochloric acid). Until now PVCu polymer specific masterbatches containing large quantities of pigment have not been available.

Conversely, polymer specific masterbatches for flexible PVC contain plasticisers. Although this does not present compatibility problems when used in rigid PVC, users are, in effect, adding plasticisers to a polymer chosen specifically for its unplasticised characteristics. This can lead to application failures due to plasticizer migration particularly in food packaging or changes in the physical properties of the final product.

PVCu polymer specific masterbatch is different because it works well both in rigid and flexible grades without any compatibility or homogenisation problems. It overcomes all the traditional difficulties associated with adding colour to rigid PVC via the masterbatch route. The product is now available in Poland through Chemiz P.H., Colour Tone's official distributor in Poland.

Chemiz is a family business run by Izabela Jezierska-Kisiel. The company has been established for over 30 years and is based in Cz?stochowa, South Poland. Originally manufacturing for the toy trade and specialising in didactic products, in 1989 the company moved into the wholesale distribution of plastics materials and masterbatches. Initially offering polyolefin and polystyrene materials Chemiz now sell polyamides and reground PE, PP and PS and custom grades. The company has much experience in supplying masterbatches in PP, PE, PS, PVC and PA offering colours and special grades such as fluorescent and speckled effect. Chemiz exclusively sell Colour Tone's range of universal and polymer specific colour masterbatches and custom additive blends for commodity and engineering polymers.

**Benefits**

PVC masterbatch offers many benefits to processors including:

- Faster colour changes.
- No loss in production rates - colours run as fast as clear material.
- Better optical properties.
- No compatibility problems.
- No homogenisation problems.
- Reduced stockholding.
- Lower polymer costs.
- Enhanced physical properties including colour ageing.
- Easily dispersed at a dosage of 1-2% for unfilled and up to 5% for filled grades.
- Overdosing up to 10% with no effect on material properties.
- Contains no plasticisers

**Formulation**

Not surprisingly the formulation and manufacturing techniques used to produce the masterbatch are closely guarded secrets but Colour Tone says they are based on existing polymer technology and involve specially modified manufacturing plant. The basic ingredients have been selected for good weatherability and excellent colour ageing characteristics. Further enhancements to outdoor performance are possible by adding UV stabilisers and absorbers while suitable approved pigments allow the masterbatch to meet all European food contact (European Resolution AP (89) 1, packaging (EU directive 94/62/EG) and toy (EN71 Part 3) criteria.

Supplied in dust-free easy flowing granules the rigid PVC masterbatch is suitable for manual mixing or automated dosing and formulated for ease of homogenisation. The polymer specific masterbatch differs from traditional thermoplastic masterbatches in that as well as combining and dispersing the active ingredients [usually coloured pigments] the polymeric part of the masterbatch it is also compounded from basic ingredients at the same time. This construction of the carrier component is one of the great advantages of the material over other PVC colouring systems, in that it allows the masterbatch to be tailored to the processors application.

Internal lubrication levels can be varied to take into account subsequent processing; external lubricant levels can be adjusted and reduced for example if surface adhesion is a factor. Ingredient types and levels can also be varied to meet a wide range of processes and applications. The carrier formulation is also varied depending on the type of functional additive [e.g. organic or inorganic pigments], the level of additive[s] or even the dosing level it is to be used at.

As compatibility is not an issue these masterbatches can be formulated for dosing at a level suitable for the process and application rather than using the minimum amount of colourant to avoid "contaminating" the PVC more than necessary.

Generally the masterbatch is easily dispersed at a recommended dosage of 1-2% and can be used in filled as well as unfilled grades. Depending on thickness and opacity required dosing in excess of 10% is possible with no effects on processing or physical properties. Indeed, the product contains additives that improve and enhance the characteristics of the base PVC, for example: ease of processing, improved weld strength, increased ductility, impact strength (especially at low temperatures), and high gloss finish.

#### Monopigment concentrates

Using raw pigment can be a messy operation and this is an important consideration on an in-line compounding operation producing food packaging products. In this situation cross-contamination is a possibility and the quality of pigment dispersion and development become factors in dry-blending and subsequent compounding. Also any colour modification requires revisiting the dry-blending stage and clean-downs are lengthy processes.

With monopigment concentrates of polymer specific masterbatch for PVCu, it is now possible to dose pre-dispersed pigments into PVCu without any of these concerns. Supplied in dust free pelletised format, formulated for optimum homogenisation, clean-down times are significantly reduced; cross contamination is eliminated and expensive dust control measures become unnecessary. These dispersions can be added to the dry-blend or dosed in-line to the polymer stream during the compounding process. Colour control becomes easier and colour modification is a relatively simple procedure.

All the pigments used in PVCu can be supplied in this format, pigment loadings reflecting the application and process being employed by the compounder. The carrier component of the concentrate is also formulated specifically for the subsequent processing. Lubrication levels are carefully controlled to ensure optimum processing characteristics in whatever the compounding process. There is no loss in production rate when processing compounds coloured with monopigment concentrates.

#### Applications

These masterbatches can be used in virtually any application from toys to tubing but they excel in food packaging and building products.

Formulated for optimum uv resistance the colours can be used in PVCu profiles for windows, underground and roofline extrusions. Grades of titanium dioxide are utilised that are not associated with the "pinkening" phenomena that has caused so much concern in this industry. Coloured pigments are selected for their weathering resistance in PVC and can be successfully incorporated at the high levels required for optimum long term performance.

Similarly PVCu masterbatches are used to produce injection moulded accessories for window systems such as cill ends, drain point covers, vent covers, screw caps etc. Injection moulding types are colour matched to extrusion grades which allows small quantities of ancillary products, offering similar weathering performance, to be produced economically.

#### Food packaging films

In thin films the PVCu masterbatch has no rivals. Large quantities of pigment can preclude most pre-dispersed products. When the quantity of colourant is high it impacts upon the properties and processing characteristics of PVCu. This can manifest itself in a number of ways: optical hazing or blooming, changes in the physical properties of the sheet/film, lamination, or processing difficulties e.g. screw slip plate out for example.

Current trends for pearlescent based colours - golds, silvers, coppers for example - require high levels of these relatively weak pigments to achieve the opacity and lustre required. These PVCu masterbatches can be incorporated at levels that simply cannot be contemplated with any other colour concentrate system without any of the associated compatibility issues mentioned earlier. Transparent colours are easily achieved and offer vibrant, bright colours with excellent clarity and no blooming.

As the masterbatch carrier can be tailored to suit the production process - calendering, extrusion etc. - optimum production rates are ensured. Additionally the compatibility of masterbatch to the base polymer reduces the likelihood of plate-out which again results in enhanced production efficiency and cost savings.

#### Contact :

Tony Gaukroger  
ColourTone Masterbatch Limited  
Pant Glas Farm Industrial Estate  
Newport Road  
Bedwas  
Gwent  
NP1 8BJ  
Telephone: 01222 888910  
Fax: 01222 868487

#### Press enquiries:

Ian McMath  
Copylines  
Telephone: 01428 723211  
Fax: 01428 722371  
Email: [ian.mcmath@btopenworld.com](mailto:ian.mcmath@btopenworld.com)

[Back](#)